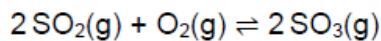


**AQA – Equilibrium constant Kp for homogeneous systems – A2 Chemistry P1**

1. June/ 2021/Paper\_1/No.5

0 5

This question is about the equilibrium



0 5 . 1

State and explain the effect, if any, of a decrease in overall pressure on the equilibrium yield of  $\text{SO}_3$ **[3 marks]**

Effect \_\_\_\_\_

Explanation \_\_\_\_\_

0 5 . 2

A 0.460 mol sample of  $\text{SO}_2$  is mixed with a 0.250 mol sample of  $\text{O}_2$  in a sealed container at a constant temperature.  
When equilibrium is reached at a pressure of 215 kPa, the mixture contains 0.180 mol of  $\text{SO}_3$

Calculate the partial pressure, in kPa, of  $\text{SO}_2$  in this equilibrium mixture.**[4 marks]**Partial pressure of  $\text{SO}_2$  \_\_\_\_\_ kPa

0 5 . 3 A different mixture of  $\text{SO}_2$  and  $\text{O}_2$  reaches equilibrium at a different temperature.

Table 4 shows the partial pressures of the gases at equilibrium.

Table 4

Gas	Partial pressure / kPa
$\text{SO}_2$	$1.67 \times 10^2$
$\text{O}_2$	$1.02 \times 10^2$
$\text{SO}_3$	$1.85 \times 10^2$

Give an expression for the equilibrium constant ( $K_p$ ) for this reaction.

Calculate the value of the equilibrium constant for this reaction and give its units.

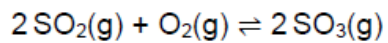
[3 marks]

$K_p$

$K_p$  \_\_\_\_\_

Units \_\_\_\_\_

- 0 5 . 4 What is the effect on the value of  $K_p$  if the pressure of this equilibrium mixture is increased at a constant temperature?



[1 mark]

Tick (✓) **one** box.

The value of  $K_p$

increases.

stays the same.

decreases.